

Consultative Committee for Space Data Systems

PROCEDURES MANUAL FOR THE CONSULTATIVE COMMITTEE FOR SPACE DATA SYSTEMS

CCSDS A00.0-Y-9

YELLOW BOOK

November 2003



FOREWORD

The Consultative Committee for Space Data Systems (CCSDS) was organized in January 1982. It provides a forum for space agencies interested in mutually developing **standard** data handling techniques to support space research, including space science and applications, conducted exclusively for peaceful purposes.

The primary products of the CCSDS are technical **Recommendations** that guide internal developments of compatible **standards** within each participating space Agency. It is believed that the CCSDS activities will significantly enhance the planning and execution of future cooperative space missions. An intrinsic contribution of the CCSDS **Recommendations** is the expected higher degree of interoperability among Agencies that observe the **Recommendations**.

The fundamental operating principle of the CCSDS is consensus. CCSDS **Recommendations** represent an approach that the Member Agencies agree is the best resolution feasible.

Although CCSDS **Recommendations** do not bind CCSDS members, member endorsements signal the following intentions:

- o Whenever an Agency establishes a CCSDS-related **standard**, this **standard** will be in accord with the relevant **Recommendation**. Establishing such a **standard** does not preclude other provisions which an Agency may develop.
- o Whenever an Agency establishes a CCSDS-related **standard**, the Agency will provide other CCSDS member Agencies with the following information:
 - the **standard** itself;
 - the anticipated date of initial operational capability;
 - the anticipated duration of operational service.
- o Specific service arrangements shall be made via memoranda of agreement. Neither a **Recommendation** nor any ensuing **standard** is a substitute for a memorandum of agreement.

At time of publication, the active Member and Observer Agencies of the CCSDS were:

Member Agencies

- Agenzia Spaziale Italiana (ASI)/Italy.
- British National Space Centre (BNSC)/United Kingdom.
- Canadian Space Agency (CSA)/Canada.
- Centre National d'Etudes Spatiales (CNES)/France.
- Deutsches Zentrum für Luft- und Raumfahrt e.V. (DLR)/Germany.
- European Space Agency (ESA)/Europe.
- Instituto Nacional de Pesquisas Espaciais (INPE)/Brazil.
- National Aeronautics and Space Administration (NASA)/USA.
- National Space Development Agency of Japan (NASDA)/Japan.
- Russian Space Agency (RSA)/Russian Federation.

Observer Agencies

- Austrian Space Agency (ASA)/Austria.
- Central Research Institute of Machine Building (TsNIIMash)/Russian Federation.
- Centro Tecnico Aeroespacial (CTA)/Brazil.
- Chinese Academy of Space Technology (CAST)/China.
- Commonwealth Scientific and Industrial Research Organization (CSIRO)/Australia.
- Communications Research Laboratory (CRL)/Japan.
- CSIR Satellite Applications Center (SAC)/South Africa.
- Danish Space Research Institute (DSRI)/Denmark.
- European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)/Europe.
- European Telecommunications Satellite Organization (EUTELSAT)/Europe.
- Federal Service of Scientific, Technical & Cultural Affairs (FSST&CA)/Belgium.
- Hellenic National Space Committee (HNSC)/Greece.
- Indian Space Research Organization (ISRO)/India.
- Institute of Space and Astronautical Science (ISAS)/Japan.
- Institute of Space Research (IKI)/Russian Federation.
- KFKI Research Institute for Particle & Nuclear Physics (KFKI)/Hungary.
- Korea Aerospace Research Institute (KARI)/Korea.
- Ministry of Communications (MOC)/Israel.
- National Oceanic & Atmospheric Administration (NOAA)/USA.
- National Space Program Office (NSPO)/Taipei.
- Space & Upper Atmosphere Research Commission/Pakistan.
- Swedish Space Corporation (SSC)/Sweden.
- United States Geological Survey (USGS)/USA.

DOCUMENT CONTROL

Document	Title	Date	Status
CCSDS A00.0-Y-4	Procedures Manual for the Consultative Committee for Space Data Systems, Issue 4	September 1990	Superseded.
CCSDS A00.0-Y-5	Procedures Manual for the Consultative Committee for Space Data Systems, Issue 5	May 1992	Superseded.
CCSDS A00.0-Y-6	Procedures Manual for the Consultative Committee for Space Data Systems, Issue 6	May 1994	Superseded.
CCSDS A00.0-Y-7	Procedures Manual for the Consultative Committee for Space Data Systems, Issue 7	November 1996	Superseded.
CCSDS A00.0-Y-8	Procedures Manual for the Consultative Committee for Space Data Systems, Issue 8	July 2002	Superseded.
CCSDS A00.0-Y-9	Procedures Manual for the Consultative Committee for Space Data Systems, Issue 9	November 2003	Current Issue. This issue has been extensively revised in order to reflect the organizational and procedural changes brought about by adoption of <i>Proposal for Restructuring the CCSDS Organization and Processes</i> , CCSDS A02.1-Y-1, April 2003. Major changes are summarized below.

Changes from issue 8:

Section 1: Some moribund information has been deleted or rephrased. Definitions from the *Proposal for Restructuring the CCSDS Organization and Processes* (CCSDS A02.1-Y-1) have been added.

Section 2: Text from previous issue has been replaced by overview material from the *Proposal for Restructuring the CCSDS Organization and Processes* (CCSDS A02.1-Y-1).

Section 3 (corresponds to subsection 3.2 in previous issue): Unchanged.

Section 4 (corresponds to subsection 3.1 in previous issue): Organization material from the previous issue (then in section 3) has been replaced by new material (in this new section)

based on the *Proposal for Restructuring the CCSDS Organization and Processes* (CCSDS A02.1-Y-1).

Section 5 (corresponds to section 4 in previous issue): Material from previous issue has been rewritten to reflect the operations proposed in the *Proposal for Restructuring the CCSDS Organization and Processes* (CCSDS A02.1-Y-1).

Section 6 (corresponds to section 5 in previous issue): Entire section has been rewritten to reflect current practices, document editor neuroses, and documentation procedures proposed in the *Proposal for Restructuring the CCSDS Organization and Processes* (CCSDS A02.1-Y-1).

Section 7 (corresponds to section 6 in previous issue): Section has been partially rewritten to reflect current practices; also, material has been added to clarify little-known procedures.

All but two annexes have been deleted.

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1 INTRODUCTION

This Procedures Manual describes the principles and details governing the Consultative Committee for Space Data Systems (CCSDS). The document addresses the objectives, organization, participation, operations, and management of CCSDS activities. It has been prepared by the CCSDS Management Council (CMC) and is maintained by the CCSDS Secretariat.

Questions about the contents or status of this document should be directed to the CCSDS Secretariat (contact information for the CCSDS Secretariat can be found on the CCSDS Web site: www.ccsds.org).

The CCSDS domain of interest is contained in its charter, which can be found on the CCSDS Web site.

1.1 PURPOSE

This document has two major purposes:

- to describe the organization of and the participation in the CCSDS;
- to define the procedures governing the operation and management of the CCSDS.

1.2 SCOPE

This document is intended to serve as a guide for the development, review, acceptance, and distribution of CCSDS products within the CCSDS Member Agency community and for the management of these activities.

1.3 APPLICABILITY

This Procedures Manual applies to all CCSDS-related activities.

1.4 RATIONALE

A complete and detailed manual of procedures for CCSDS activities will result in the achievement of CCSDS objectives in an orderly and effective manner.

1.5 DOCUMENT STRUCTURE

This document is organized as follows:

- Section 1 addresses the purpose and scope of this document and defines terms associated with CCSDS products.

- Section 2 provides a brief overview of the CCSDS.
- Section 3 deals with participation in the CCSDS and presents the alternative levels of association open to those organizations wishing to participate.
- Section 4 describes the organization of CCSDS. It details the internal structure and outlines the responsibilities of each component.
- Section 5 presents the operational procedures for the organization and provides details on the products and methodologies.
- Section 6 addresses document development, providing procedures for development and progression of CCSDS documents, as well as change control methods.
- Section 7 addresses document management in the areas of document numbering, distribution, and archive functions.
- The annexes contain additional supporting information.

1.6 CONVENTIONS AND DEFINITIONS

1.6.1 CONVENTIONS

The following conventions apply throughout this Manual:

- a) the words ‘shall’ and ‘must’ imply a binding and verifiable specification;
- b) the word ‘should’ implies an optional, but desirable, specification;
- c) the word ‘may’ implies an optional specification;
- d) the words ‘is’, ‘are’, and ‘will’ imply statements of fact.

1.6.2 NOMENCLATURE

1.6.2.1 Standards and Recommendations

A **standard** is a formal specification that defines and governs functions and protocols at interfaces between major subsystems of a data system. Use of a standard implies agreement to adhere to conformance requirements of that standard.

A **CCSDS Recommendation** is a technical specification formulated to provide a basis for a standard.

1.6.2.2 Document Colors

When formed in 1982, the CCSDS established a color system for identifying both the type and status of CCSDS documents. According to this system, final CCSDS Recommendations were called ‘Blue Books’ and were published with blue covers; Draft Recommendations were called ‘Red Books’ and were published with red covers; preliminary drafts of Recommendations (Proposed Recommendations) were called ‘White Books’ and had white covers; technical reports were called ‘Green Books’ and had green covers; etc. Within CCSDS this color system is still widely used in discussions of documents.

The advent of electronic publishing, making color coding of document covers problematic, and the creation of new document types, each associated with a new cover color, have made maintenance of a consistently applied color code scheme a complex task; and even though the term ‘CCSDS Blue Book’ is widely recognized, reference to document types by abstract color designations is likely to be confusing to persons unfamiliar with CCSDS history. In this Procedures Manual reference to document colors has been minimized, and preference has been given to use of terms that describe the actual type and status of documents (e.g., ‘Draft Recommendation’ is preferred over ‘Red Book’).

1.6.2.3 CCSDS Standards Track

Standards Track documents are those that are intended to influence and enhance the international installed base of CCSDS-compatible space mission support infrastructure. Generally, they are developed in response to a direct mission or operational need (a ‘hard requirement’) that has been identified via the CCSDS Management Council (CMC) Customer Interface function and approved by a customer group.

Standards Track specifications normally must not depend on other Standards Track specifications that are at a lower maturity level, or on non-Standards Track specifications other than referenced specifications from other standards bodies.

Two types of documents are developed on the CCSDS Standards Track:

- CCSDS Recommendation;
- CCSDS Best Current Practice document (BCP).

1.6.2.4 CCSDS Non-Standards Track

CCSDS Non-Standards Track contains three types of technical documents that are not on the CCSDS Standards Track:

- Experimental Specification;
- Informational Report;
- Historical document.

1.6.2.5 CCSDS Administrative Track

The Administrative track contains those documents that relate to the organization and administration of CCSDS, such as charters, procedures, and meeting minutes. Documents in the Administrative track are called CCSDS Records.

1.7 REFERENCES

The following documents contain provisions which, through reference in this text, constitute provisions of this Manual. At the time of publication, the editions indicated were valid. All documents are subject to revision, and users of this Manual are encouraged to investigate the possibility of applying the most recent editions of the documents indicated below. The CCSDS Secretariat maintains a register of currently valid CCSDS Publications.

- [1] *Strategic Plan of the Consultative Committee for Space Data Systems.* CCSDS A01.1-Y-1. Yellow Book. Issue 1. Washington, D.C.: CCSDS, December 1999.
- [2] *CCSDS Operating Plan for Standards Development.* CCSDS A01.2-Y-1. Yellow Book. Issue 1. Washington, D.C.: CCSDS, December 1999.
- [3] *CCSDS Publications Manual.* CCSDS A20.0-Y-1. Yellow Book. Issue 1. Washington, D.C.: CCSDS, May 1994.

2 OVERVIEW

2.1 CCSDS ORGANIZATION

The CCSDS organizational units are

- CCSDS Management Council (CMC):
 - ISO Technical Committee 20, Subcommittee 13;
 - CCSDS Liaisons;
 - Industrial Relations;
 - Customer Relations;
 - CCSDS Secretariat;
 - Space Assigned Numbers Authority (SANA);
- CCSDS Engineering Steering Group (CESG):
 - CCSDS Domains:
 - CCSDS Areas:
 - Working Groups (WGs);
 - Birds of a Feather (BOF) Groups.

The relationships among these organizational units are shown in figure 2-1.

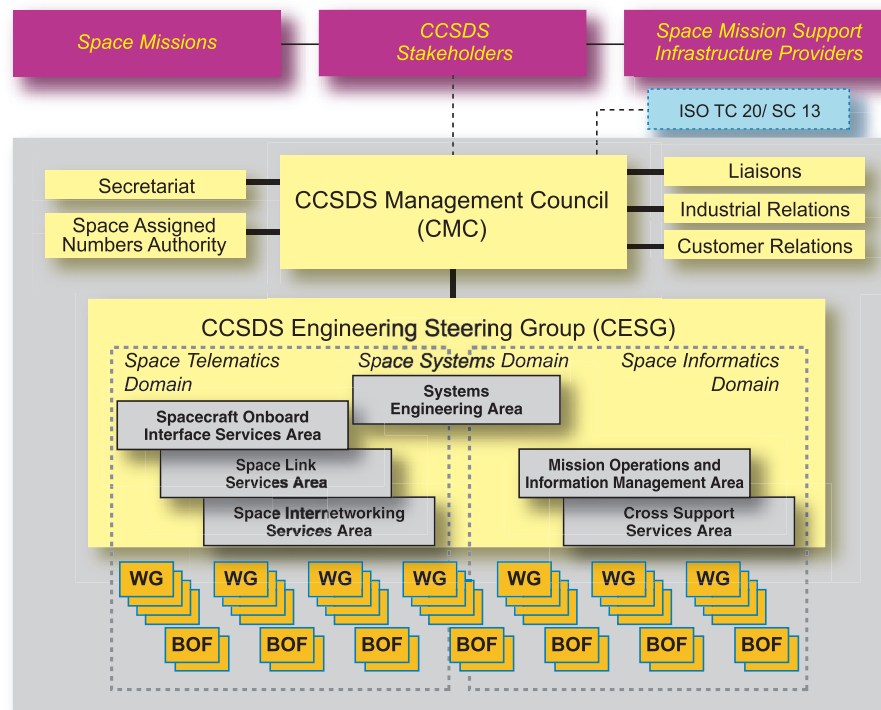


Figure 2-1: Top-Level Organization

At the top level, the work of CCSDS logically cleaves into three abstract ‘domains’ that enclose the technical disciplines of the organization:

SPACE INFORMATICS DOMAIN: the web of applications, distributed across the spacecraft and their ground support systems, which are used to actually fly missions (mission planning; navigation; mission control; scientific data processing; etc.). Typically, the Informatics domain is concerned primarily with the semantic interpretation of information rather than how it is physically moved from place to place. The Informatics domain is the rough ‘space analog’ of the diverse and complex set of applications that form the terrestrial World Wide Web.

SPACE TELEMATICS DOMAIN: the communications protocols by which these applications exchange information. It is assumed that nearly all ground communications are commercially based, and that more specialized protocols are employed when crossing into space regions. Typically, the Telematics domain is concerned primarily with how data units are moved from place to place rather than how they are converted into user information within the applications. The Telematics domain is the ‘space analog’ of the communications networks by which the Web applications exchange information over the terrestrial Internet.

SPACE SYSTEMS DOMAIN: the high-level functions that cut across both of the other domains, e.g., the global architecture of how space mission information systems are constructed and how information is represented, and cross-cutting issues such as security.

Within the umbrellas of these three abstract domains are four concrete organizational constructs:

BIRDS-OF-A-FEATHER groups (BOFs) that perform start-up studies and gestate technical proposals to the point where establishment of a Working Group may be decided.

WORKING GROUPS (WGs) that are chartered to produce specific work items on a specific schedule and within specific resource envelopes, going out of business on completion of that work.

AREAS that contain WGs and BOFs that are closely related to a particular technical discipline, under the coordination of an expert Area Director.

A CCSDS ENGINEERING STEERING GROUP (CESG) that is the forum whereby the Area Directors synchronize the overall technical program of work.

2.2 CCSDS STAKEHOLDERS

CCSDS Stakeholders belong to the following broad categories:

- a) ‘Space Mission’ organizations that directly execute scientific and applications space missions, or

- ‘Space Mission Support Infrastructure Provider’ organizations that design, operate and maintain the worldwide tracking, data acquisition, mission control, data processing, and data archiving networks that are exposed to Space Mission organizations for the purposes of ‘cross support’.
- b) ‘Space Data User’ organizations representing the utilization community who consume the information generated by the Space Mission.

3 PARTICIPATION

3.1 CATEGORIES OF PARTICIPATION

3.1.1 GENERAL

Participants in the CCSDS are classified in one of four categories: Member Agency, Observer Agency, Liaison, or Associate. Any organization wishing to participate in the CCSDS activity should petition the CCSDS Secretariat in writing requesting permission to participate in one of the four categories as defined below. In the case of an application for Member Agency, Observer Agency, or Liaison status, the CCSDS Secretariat shall present each request to the CMC for consideration and approval. Following the CMC decision, the Secretariat shall notify the agency or organization of the result.

In the case of a request for CCSDS Associate status, the organization is approved once the application has been

- completed by the applicant;
- approved by the Principal Delegate of the sponsoring Member or Observer Agency;
- signed by the CCSDS Secretariat.

Generally, the sponsoring Agency and CCSDS Associate shall be from the same country; however, multinational organizations (e.g., the European Space Agency) can sponsor Associates provided that the proposed Associate is from a country that is affiliated with the sponsoring Agency.

3.1.2 MEMBER AGENCY

Only agencies having significant responsibilities for space development, operations, or research may participate as CCSDS Member Agencies. Furthermore, Member Agencies shall be governmental or quasi-governmental organizations and shall indicate a willingness to participate substantially in CCSDS activities (including attendance at CMC meetings) and provide a commensurate level of support. They shall notify their approval of the Charter and shall make their best effort to ensure the adherence of their internal standards to the applicable Recommendations of the CCSDS.

No more than one agency representing a given country or multinational organization may participate as a Member Agency of the CCSDS. However, the number of such national or multinational agencies that may participate as Observer Agencies is not limited.

3.1.3 OBSERVER AGENCY

Observer Agencies are organizations that have a strong interest in space development, operations, or research. CCSDS Observer Agencies are those agencies that indicate a desire

to participate in CCSDS activities but at a reduced level of effort. Observer Agencies are encouraged to maintain their internal standards so as to be compatible with the applicable Recommendations of the CCSDS.

3.1.4 LIAISON

Liaison organizations are those governmental or private activities which have developmental programs in the areas of space-related data and information systems.

Liaison status is open to non-commercial, standards-developing organizations operating in areas similar to those of the CCSDS. Liaison organizations receive all CCSDS documentation released for external dissemination; they are welcome to submit comments or initiate Review Item Dispositions (RIDs) on CCSDS review documents.

3.1.5 ASSOCIATE

Scientific or industrial organizations may participate as Associates, provided they are sponsored by a Member or Observer Agency in their country. CCSDS Associates are those industrial or academic organizations which indicate a desire to monitor closely CCSDS activities. Associates receive all CCSDS documentation released for external dissemination. They are welcome to submit comments or RIDs on CCSDS review documents. The procedure relative to RID submission is at the election of the sponsoring agency. Associates may participate in CCSDS technical meetings and discussion forums with the explicit approval of the sponsoring Member Agency.

3.2 MEMBERSHIP LISTS

The Secretariat shall maintain lists of Member Agencies, Observer Agencies, Liaison organizations, and Associate organizations. These lists are maintained on the CCSDS Web site.

4 ORGANIZATION

4.1 CCSDS MANAGEMENT COUNCIL (CMC)

4.1.1 PURPOSE

The CCSDS Management Council (CMC) is the executive management oversight group of the CCSDS.

4.1.2 CMC CONSTITUENTS

4.1.2.1 CMC Membership

The CMC members are the CCSDS Member Agency Principal Delegates and the CESG Chair:

- a) each CCSDS Member Agency shall appoint one Principal Delegate who is authorized to
 - 1) represent his or her Agency in policy matters that come before the CMC, and
 - 2) commit resources of his or her Agency to the standards development activities undertaken by the CCSDS;
- b) the CESG Chair is appointed by the CCSDS Member Agency Principal Delegates.

4.1.2.2 CMC Chair

One of the Member Agency Principal Delegates shall serve as CMC Chair for a renewable three-year term on a rotating basis. The CCSDS Member Agency whose Principal Delegate chairs the CMC shall also provide the CCSDS Secretariat.

4.1.3 CMC ADJUNCTS

4.1.3.1 ISO Technical Committee 20, Subcommittee 13

Under an agreement entered into between CCSDS and ISO in the mid 1990s, CCSDS acts as the principal technical engine of ISO Technical Committee 20 (TC 20)/Subcommittee 13 (SC 13), and most CCSDS Recommendations are processed into full ISO standards via this relationship. The charter and scope of ISO TC 20/SC 13 can be found on the CCSDS Web site.

4.1.3.2 CCSDS Liaisons

The CMC acts as representative of the interests of the CCSDS in formal Liaison relationships with other organizations concerned with standards and other technical and organizational

issues relevant to international space mission cross support. Liaison organizations are those governmental or private enterprises that have their own developmental programs in the area of space data and information transfer systems and who wish to establish formal information-sharing relations with CCSDS.

4.1.3.3 Industrial Relations

The Industrial Relations function promotes communication with and feedback from the commercial supplier base in order to encourage investment in providing standards-compatible systems and equipment.

4.1.3.4 Customer Relations

The Customer Relations function acts as a source of advice and guidance to customers concerning architectural, procedural, and (where appropriate) policy matters pertaining to international space mission cross support and its enabling technologies. It focuses on two-way information exchange, explaining existing CCSDS capabilities to potential customers and sponsors and gathering requirements from them for expanding the suite of CCSDS Recommendations to meet their needs. Customer inputs that are gathered via this function are translated into a proposed work item and often cause a BOF to be initiated. The BOF develops the work proposal and resource estimates so that customer deliverables can be negotiated and resources can be lined up to support the necessary development. Throughout the development process, this function provides the formal interface between the developer and the customer, so that customer satisfaction can be both measured and assured.

4.1.3.5 CCSDS Secretariat

The CCSDS Secretariat edits, formats, and publishes CCSDS Recommendations (in their various stages of maturity) and provides one definitive repository for all CCSDS documentation. The Secretariat also assists in scheduling and supporting all CCSDS meetings.

An important role of the Secretariat is to support the CMC process of formal Agency review. The vehicle for such review is the 'Review Item Disposition' or 'RID'. When a document requires formal review, the Secretariat will announce the review opportunity to the CCSDS Agencies and will provide instructions that define how, when, and to whom the Agency comments (in the form of completed RIDs) are to be submitted.

The Secretariat shall provide a wide range of Web-based information services in support of the technical development work of CCSDS. These include archived mailing lists, document manipulation and sharing services, document libraries, electronic balloting facilities and a system to log and distribute Concept Papers that are derived early in the development process. The Secretariat shall also provide Web-based information services that cater to the two-way flow of information between CCSDS and its customers and industrial suppliers.

4.1.3.6 Space Assigned Numbers Authority (SANA)

The core registrar for the CMC's activities is the SANA. Many space mission protocols require that someone keep track of key protocol numbering assignments that were added after the protocol came out. Typical examples of the kinds of registries needed are for Spacecraft IDs, protocol version numbers, reserved APIDs, and SFDU Control Authorities. The SANA provides this key configuration management service for CCSDS. The CMC approves the organization that will act as the SANA. Its public interface is focused through Web-based services provided by the Secretariat.

4.1.4 CMC REQUIREMENTS

CMC Functions, Responsibilities, and Operating Principles are detailed in the CMC Charter, which can be found on the CCSDS Web site.

4.2 CCSDS ENGINEERING STEERING GROUP (CESG)

4.2.1 PURPOSE

The CCSDS Engineering Steering Group (CESG) provides technical management across CCSDS domains and top-level coordination of the overall international standardization process. It ensures that all developments occur in accordance with procedures, schedules, and resources that have been negotiated with the CMC. To do its job the CESG adopts and applies uniform architectural views that guide the systems protocols, policies and procedures used for international space mission cross support. The CESG is directly responsible for executing the actions associated with entry into and movement along the CCSDS standardization tracks, including making recommendations to the CMC for approval of specifications as they progress through the various stages of standardization.

4.2.2 CESG CONSTITUENTS

The CESG consists of a chairperson and the Area Directors (ADs), who are appointed by the CMC for renewable two-year terms. Deputies may be appointed for the CESG Chair and the ADs, at the discretion of the CMC.

Nominations for CESG positions are made by the Principal Delegates from the Agencies. Appointees may come from any organization and do not have to be employees of space Agencies. All CESG appointees must have a sponsor who will commit to support their salary and travel to CESG and Area coordination meetings.

A candidate for selection as CESG Chair or Area Director must have demonstrated the ability to function independently of his/her own Agency's agenda and must be able to provide fair leadership in the development of international consensus.

A candidate for selection as CESG Chair (or Deputy Chair) must be an internationally recognized technical expert, having broad expertise in the standardization aspects of space missions and their supporting infrastructure, and must have extensive prior experience working within the CESG (such as having served as an Area Director or Working Group Chair or having served as Deputy Chair prior to succeeding to Chair).

A candidate for selection as an AD must be recognized as a leading technical expert in the field covered by that Area and must have extensive prior experience leading a specific standards development task within the CCSDS, such as having served as a Working Group Chair or Deputy Chair.

4.2.3 CESG ADJUNCTS

4.2.3.1 Working Groups

Working Groups perform technical work under direction of the CESG (see 4.3).

4.2.3.2 Birds-of-a-Feather Groups (BOFs)

Birds-of-a-Feather (BOF) groups are the primary instigators of new technical work within the CCSDS (see 4.4).

4.2.4 CESG REQUIREMENTS

4.2.4.1 General

CESG Functions, Responsibilities, and Operating Principles are detailed in the CESG Charter, which can be found on the CCSDS Web site.

4.2.4.2 CESG Chair

The CESG Chair shall be responsible for:

- a) being a member of the CMC as the single representative of the entire CCSDS technical organization;
- b) setting the date, location, and agenda for each CESG meeting, and communicating this information to the Area Directors so that they may schedule the completion of their work prior to this time;
- c) chairing the CESG meetings, ensuring that every Area presents its work in a satisfactory manner and that CESG decisions are made in a consensus setting;

- d) ensuring that all CCSDS work follows an agreed set of architectural principles and is properly synchronized with the smooth evolution of the large installed base of CCSDS-compatible mission support infrastructure;
- e) working with the ADs to prepare detailed reports of overall status, progress, and problems for presentation at CMC meetings (as necessary, the CESG Chair may request specific ADs to attend CMC meetings to discuss difficult issues);
- f) maintaining the master-tracking list of all CCSDS specifications as they progress through the standardization tracks, and making recommendations to the CMC for the approval and progression of documents as they approach key decision gates;
- g) verifying that formal review procedures have been properly followed prior to recommending the advancement of a document;
- h) making sure that technical cross-pollination occurs among the various Areas and WGs by encouraging ADs to hold Area meetings and by seeking opportunities to hold occasional CCSDS plenary meetings that are attended by all participants (such opportunities may be arranged in conjunction with major conferences);
- i) seeking opportunities to advertise and promulgate the work of CCSDS by alerting ADs to opportunities to publish results or participate in relevant conferences.

4.2.4.3 Area Director

An Area Director shall be responsible for:

- a) being a member of the CESG as the single representative of the CCSDS technical Area;
- b) screening all proposals to form new WGs that are brought forward by BOFs to make sure that they are supported by required documentation and that their technical focus is vectored towards the goals and objectives of CCSDS;
- c) making recommendations to the CESG concerning approval for the chartering and formation of WGs and for the authorization of BOFs;
- d) making recommendations to the CESG for the progression of WG documents as they approach key decision gates along the various standardization tracks;
- e) demonstrating and certifying that formal review procedures have been properly followed prior to recommending the advancement of a document;
- f) communicating the dates of CESG meetings to the WG and BOF chairs so that they may schedule the completion of their work prior to CESG meetings;
- g) notifying the WG and BOF chairs as to how and when their work is to be presented to the AD for review;

- h) deciding if Area meetings are to be held and, if so, setting the date, location, and agenda for each Area meeting;

NOTE – It is strongly recommended that periodic face-to-face co-located meetings of the WGs and BOFs in a particular Area should be held in order to maximize opportunities for cross-pollination of ideas.

- i) chairing Area meetings, ensuring that every WG or BOF presents its work in a satisfactory manner and that Area decisions are made through a process of consensus;
- j) ensuring that all Area work follows the set of architectural principles agreed on by the CESG and is properly synchronized with the smooth evolution of the large installed base of CCSDS-compatible mission support infrastructure;
- k) working with the WG and BOF chairs to prepare detailed reports of overall status, progress and problems for presentation at CESG meetings; as necessary, the AD may request specific WG or BOF chairs to attend CMC meetings to discuss difficult issues;
- l) verifying that all Standards Track documents are subject to the proper process of formal Agency review by the WG Chair;
- m) maintaining the Area master-tracking list of relevant specifications as they progress through the standardization tracks;
- n) making recommendations to the CESG to re-convene a WG to refresh a Recommendation that has been finalized and deployed into operational use, and for which the WG is no longer active;
- o) making sure that technical cross-pollination occurs among the various WGs (this will be accomplished by seeking frequent opportunities to hold Area meetings);
- p) seeking opportunities to advertise and promulgate the work of the Area by alerting WG and BOF chairs to opportunities to publish results or participate in relevant conferences.

4.3 WORKING GROUPS

4.3.1 PURPOSE

A CCSDS Working Group (WG) is formed to develop a specific work item, such as a CCSDS Recommendation, an Experimental Specification, or a Best Current Practice document.

4.3.2 WG CONSTITUENTS

WGs are made up of technical experts from the CCSDS Agencies and industry participants.

WG chairs are nominated by an Area Director and approved by the CESG. A candidate for selection as WG Chair must be recognized as a leading technical expert in the field covered by that WG. Candidates may come from any organization and do not have to be employees of space Agencies.

The role of the WG Chair is to keep the discussion moving forward towards the milestones in the WG charter, usually leading to publication of one or more CCSDS Recommendations. They are not meant to be taskmasters, but are responsible for assuring positive forward motion and for preventing random wandering.

4.3.3 WG REQUIREMENTS

4.3.3.1 General

Each WG shall have a specific published and approved charter and schedule, along with a set of associated resources, which must be committed by a sponsor, to do the work. No WG shall be initiated by CCSDS unless a credible resource plan has been prepared and someone has agreed to provide the necessary support.

The WG charter shall state the scope of discussion for the WG, as well as its goals and deliverable products. When a WG has fulfilled its charter, it shall cease operations.

4.3.3.2 Working Group Chair

A WG Chair shall be responsible for:

- a) creating a charter, work plan, and resource plan for the WG and getting it approved by the Area Director and the CESG;
- b) publishing the approved work plan, showing the scope of its tasks, their schedule, and the nature and source of the resources needed for their completion;
- c) making sure that necessary resources are committed by someone during the initiation and conduct of new work or the modification of work in progress;
- d) managing the day-to-day activities of the WG so that its chartered products are delivered on a negotiated schedule and within a set of negotiated resources;
- e) deciding which documents should be published as ‘official’ WG drafts, and which should not;
- f) managing the progression of documents along the various standardization tracks and securing the approval of the AD before advancing their designations towards finalization;

- g) obtaining specific CMC authorization, via the CESG and the AD, for initiating document transitions that require a formal Agency review;
- h) making sure that the review comments resulting from formal Agency reviews are properly dispositioned in a consensus environment before recommending change in a document's designation;
- i) reporting status, progress, and 'red flag' items to the Area Director in a timely manner;
- j) working with the Area Director to synchronize WG activities with the CCSDS meeting and reporting cycle established by the CMC;
- k) publishing detailed WG meeting agendas (see 5.2.5.4);
- l) chairing WG meetings and making sure that the proceedings follow a process of consensus;
- m) appointing technical editors to draft documents and document rapporteurs as necessary to be the focal points for making progress on a specification;
- n) ensuring that the activities and progress of the WG are made visible to all WG members (and to the public, as appropriate) by requiring the use of Web-based information services provided by the Secretariat; as a minimum, the WG Chair must ensure that all major WG discussions and decisions are captured and archived via an official WG mailing list;
- o) maintaining the WG tracking list of relevant specifications as they progress through the standardization tracks, and making recommendations to the AD for the progression of documents as they approach key decision gates;
- p) seeking opportunities to advertise and promulgate the work of the WG by alerting WG members to opportunities to publish results or participate in relevant conferences.

4.4 BIRDS-OF-A-FEATHER GROUPS (BOFS)

4.4.1 PURPOSE

Birds-of-a-Feather (BOF) groups are formed in order to get support for establishing an eventual CCSDS WG.

4.4.2 BOF CONSTITUENTS

Although many BOFs will be initiated from inside the CCSDS organization in order to respond to concrete or prospective customer needs, anyone (from any organization and not necessarily already affiliated with CCSDS) can start a BOF with a view towards convincing an Area Director that the project is worthwhile and is a positive contribution to the work of

CCSDS. A face-to-face meeting is useful for this, although it is not necessary to wait for a meeting opportunity to get some work done, such as setting up an informal mailing list, writing and circulating a CCSDS Concept Paper that outlines the proposed technical scope of the work, and starting to discuss a charter. BOF meetings have a very different tone from WG meetings: their focus is to create a good charter with good milestones, and to prove that there are enough resources potentially available to do the work needed in order to create standards.

4.4.3 BOF REQUIREMENTS

BOFs shall be authorized by an AD and shall be responsible for developing the following:

- a) a proposal;
- b) a draft charter;
- c) a resource plan;
- d) a CCSDS Concept Paper outlining the technical scope of the proposed work.

At such time as a BOF feels that it has enough agreement to propose formation of a WG, it must schedule a meeting with its AD to present its case. The AD makes the initial determination whether:

- a) to advocate the work further;
- b) to recommend more BOF work on the charter, resource plan, or Concept Paper;
- c) to reject the proposal.

The AD shall forward the draft charter, resource plan, and Concept Paper to the CESG with a recommendation to accept or reject the proposal.

5 OPERATIONS

5.1 TOOLS OF OPERATION

5.1.1 OFFICIAL LANGUAGE

English shall be the official language used at all CCSDS-sponsored meetings. Furthermore, CCSDS correspondence, Reports, and Recommendations shall be in English.

5.1.2 CONSENSUS

The decisions of all CCSDS organizational units shall be reached through consensus. In this context, consensus does not necessarily mean that unanimous agreement has been reached, but that the result incorporates the best set of compromises to which all parties can agree.

5.1.3 CMC RESOLUTIONS

CMC Resolutions are the executive decisions of the CMC and shall be concise statements of consensus among the CMC members.

5.1.4 FORMAL REVIEW

Before approving major transitions in the status and designation of most Standards Track documents, they must be submitted to the Member Agencies of CCSDS for formal review (see 6.1.2.3). The CESG will specifically look for evidence that all review comments have been properly dispositioned in a consensus environment before permitting such transitions.

5.1.5 CCSDS WEB SITE

5.1.5.1 General

The Secretariat shall provide a Web site for official CCSDS business.

5.1.5.2 Official CCSDS Document Repository

The CCSDS Web site shall be the official repository for CCSDS documents:

- a) the Secretariat shall be responsible for posting and maintaining published documents, Draft Recommendations and Draft BCPs, and all other document types that have completed active WG development and are eligible for retention;
- b) the chairs of individual organizational units shall be responsible for posting and maintaining internal documents such as charters, local procedure documents, and meeting minutes;

- c) document developers shall be responsible for posting and maintaining draft versions of documents under active development within a WG or BOF.

NOTE – Access to WG- or BOF-internal drafts may be restricted to group members or some other subset of CCSDS participants.

5.1.5.3 Document Management Tools

The Secretariat shall provide server work areas and document management tools for the CMC, CESG, Areas, WGs, and BOFs. Work area owners shall have the ability to set access restrictions on the contents of their work areas.

5.1.5.4 Official CCSDS E-mail Lists

The Secretariat shall maintain an e-mail list server and provide moderated announcement and discussion e-mail lists for all CCSDS organizational units, including WGs and BOFs. A Web interface shall be provided for access to list archives.

The e-mail lists maintained by the Secretariat shall be the official CCSDS e-mail lists and shall be used for all official CCSDS correspondence distributed via e-mail to CCSDS organizational units.

5.1.5.5 Meeting Schedules and Registration Tools

The Secretariat shall maintain a calendar of CCSDS meetings and provide tools for scheduling and on-line meeting registration.

5.2 MEETINGS

5.2.1 GENERAL

The CMC shall define the requirements for scheduling the overall CCSDS meeting cycle so that work results may be reported in a logical and orderly sequence and management decisions can be made in a timely manner. The following broad rules are established; however, the CMC may at any time issue more restrictive policies that limit the choices.

5.2.2 CMC MEETINGS

5.2.2.1 Purpose

CMC meetings are convened to discuss matters related to the executive management oversight of the CCSDS.

5.2.2.2 Schedule

The CMC will meet twice per year and must publish its proposed meeting schedule at least two years in advance.

5.2.2.3 Location

The CMC may rotate its meetings among the CCSDS Member Agencies as necessary to satisfy hosting protocol. However, in order to minimize travel costs for delegates there may be practical constraints on the choice of locations for CMC meetings.

5.2.2.4 Agenda

Two months prior to each CMC meeting, the Secretariat shall distribute a preliminary agenda and a meeting announcement. The preliminary agenda shall list the new issues to be considered during the discussion of each agenda item together with a list of open action items from previous meetings. Requests for Agency inputs to this draft agenda shall be made at this time. Agency Heads of Delegation are required to indicate the status of their individual action items at this time.

One month prior to each CMC meeting, the Secretariat shall distribute a revised agenda that includes Agency inputs relative to both agenda suggestions and action item status. It is the responsibility of those Agencies submitting papers for discussion at an upcoming meeting to make copies of such papers available on the CCSDS Web site one month prior to that meeting to allow sufficient time for Agencies' review.

The Secretariat shall prepare draft meeting minutes and post them on the CCSDS Web site for review to the CMC members, Observer Agencies, liaisons, and all CESG members. CMC meeting minutes remain in draft status until formally approved by the CMC.

5.2.2.5 Participation

The following general guidelines apply to participation in CMC meetings by groups affiliated with CCSDS. Participation is not limited to these groups; the CMC has the discretion to invite others, e.g., industry representatives or technical experts, to attend particular CMC meetings. However, except as noted below, attendance is by invitation only.

- a) **Member Agency.** The Principal Delegates of the CCSDS Member Agencies are expected to attend all CMC meetings.
- b) **Observer Agency.** Delegates of CCSDS Observer Agencies may attend CMC meetings but may not participate in formal polling intended to result in CMC Resolutions.
- c) **Liaison.** Delegates of Liaison organizations may attend CMC meetings at the invitation of the CMC.

- d) **Associate.** Delegates of Associate organizations may attend CMC meetings at the invitation of the CMC.
- e) **CESG.** The CESG Chair shall attend the CMC meetings to report technical progress and make recommendations about the program of work. The CESG Chair may be supported by key Area Directors as he or she feels necessary.

5.2.3 CESG MEETINGS

5.2.3.1 Purpose

The CESG meets to prepare progress reports, proposals, recommendations, and other materials prior to the scheduled CMC meetings.

5.2.3.2 Schedule

As a minimum, the CESG must meet face-to-face twice per year in advance of scheduled CMC meetings. The CESG meeting must be completed prior to the CMC meeting, with sufficient time allocated to formulate the CESG report. Interim CESG meetings may be arranged as necessary at the discretion of the Chair.

5.2.3.3 Location

CESG meetings may be co-located with CMC meetings or may be held in the vicinity of institutions where a significant staff participation in the group exists. Alternative locations are permissible if approved by the CMC.

NOTE – There is no requirement to co-locate the CESG and CMC meetings.

5.2.3.4 Meeting Materials

A least six weeks prior to a meeting, the CESG Chair shall distribute a meeting announcement that includes a preliminary agenda and a recommended attendance list.

A least three weeks prior to a meeting, the CESG Chair shall distribute a final agenda, reflecting input resulting from review of the preliminary agenda, along with any meeting materials requiring review in advance of the meeting.

NOTE – Distribution of meeting materials may be accomplished by providing a link to a repository on the CCSDS Web site.

A formal report on each meeting shall be presented to the CMC, and a register of meeting input documents, meeting minutes, and meeting conclusions and recommendations shall be maintained in the CESG work area on the CCSDS Web site.

5.2.3.5 Participation

The CESG Chair and Area Directors are expected to attend all CESG meetings. In cases where attendance is not possible, a deputy must attend.

WG and BOF participants, industry representatives, and technical experts may be asked to attend as necessary to deliver reports and participate in technical discussions. The CESG Chair shall determine the attendance criteria for individual meetings.

5.2.4 AREA MEETINGS

5.2.4.1 Purpose

In general, Area meetings are convened for face-to-face technical discussion aimed at achieving consensus.

5.2.4.2 Schedule

Area meetings are convened at the discretion of the AD. If an AD deems it to be beneficial to hold an Area meeting, the only constraint on the schedule is that it complete its business prior to the CESG meeting with sufficient time allowed to formulate an Area report.

5.2.4.3 Location

The location of an Area meeting shall be determined by the Area Director. As a general guideline, Area meetings shall be held in the vicinity of institutions where a significant staff participation in the Area exists.

5.2.4.4 Meeting Materials

A least six weeks prior to a meeting, the AD shall distribute a meeting announcement that includes a preliminary agenda and a recommended attendance list.

A least three weeks prior to a meeting, the AD shall distribute a final agenda, reflecting input resulting from review of the preliminary agenda, along with any meeting materials requiring review in advance of the meeting.

NOTE – Distribution of meeting materials may be accomplished by providing a link to a repository on the CCSDS Web site.

A formal report on the Area meeting shall be presented to the CESG, and a register of meeting input documents, meeting minutes, and meeting conclusions and recommendations shall be maintained in the Area's work area on the CCSDS Web site.

5.2.4.5 Participation

The AD shall determine who participates in Area meetings based on the technical foci of the meeting.

5.2.5 WORKING GROUP MEETINGS

5.2.5.1 Purpose

Working Group meetings are convened to enable face-to-face technical discussions leading to consensus.

5.2.5.2 Schedule

In the absence of requirements for an Area meeting, the WG Chair shall decide if, when, and where face-to-face WG meetings are to be held.

5.2.5.3 Location

Working Group meetings shall be held in the vicinity of institutions where a significant staff participation in the group exists. Alternative locations are permissible only if specifically approved by the Area Director.

Working Groups and BOFs may co-locate in order to provide maximum opportunities for technical interchange across different groups.

5.2.5.4 Meeting Materials

A least six weeks prior to a meeting, the WG Chair shall distribute a meeting announcement and a preliminary agenda.

A least three weeks prior to a meeting, the AD shall distribute a final agenda, reflecting input resulting from review of the preliminary agenda, along with any meeting materials requiring review in advance of the meeting.

NOTE – Distribution of meeting materials may be accomplished by providing a link to a repository on the CCSDS Web site.

A formal report on the Area meeting shall be presented to the CESG, and a register of meeting input documents, meeting minutes, and meeting conclusions and recommendations shall be maintained in the WG work area on the CCSDS Web site.

NOTE – Upon dissolution of the WG, these materials will be archived by the Secretariat.

5.2.5.5 Participation

Working group participation is generally limited to working group members; however, occasional participation by technical experts may take place.

5.2.6 BOF MEETING

5.2.6.1 Purpose

BOFs meet as necessary to develop the materials needed to proposed formation of a Working Group (see 4.4.3). At such time as a BOF feels that it has enough agreement to propose formation of a WG, it must schedule a meeting with its authorizing AD to present its case.

5.2.6.2 Schedule

BOF meetings are scheduled as needed to perform BOF work; there is no requirement that BOFs hold face-to-face meetings if the work can be accomplished by other means.

An initial ad-hoc meeting may be held in conjunction with co-located Area and WG meetings for the purpose of gauging interest in forming a BOF.

The AD to whom the BOF will make its presentation shall determine the schedule for the presentation meeting based on the constraints identified in 5.2.4.2 and 5.2.5.2.

5.2.6.3 Location

The location of BOF meetings convened in the course of BOF work are outside the scope of this Procedures Manual; however, such meetings may be co-located with WG and Area meetings as appropriate. The AD to whom the BOF will make its presentation shall determine the location for the presentation meeting based on the constraints identified in 5.2.4.3 and 5.2.5.3.

5.2.6.4 Meeting Materials

All materials developed in the course of BOF work should be maintained in an assigned BOF work area on the CCSDS Web site.

5.2.6.5 Participation

Participation in BOF meetings is outside the scope of this Procedures Manual.

5.2.7 PLENARY CONFERENCE MEETINGS

5.2.7.1 Purpose

CCSDS plenary conferences

- a) provide an opportunity to chart a long-range course for future work; and
- b) provide an opportunity for external liaison with non-affiliated space agencies or other relevant standards bodies.

5.2.7.2 Schedule

CCSDS plenary conferences are organized at the discretion of the CMC. There is no requirement to hold plenary conferences on a regular basis.

5.2.7.3 Location

CCSDS plenary conferences are typically co-located with major international conferences or other CCSDS events.

5.2.7.4 Meeting Materials

The Secretariat may prepare informational and promotional materials for distribution to plenary conference participants.

Papers presented at CCSDS plenary conferences shall be delivered to the Secretariat for posting on the CCSDS Web site.

5.2.7.5 Participation

Plenary meetings are open to all interested parties. Members of each of the four CCSDS categories are automatically invited to a plenary conference. Tutorials on CCSDS activities will be given to individuals involved in space-flight projects and ground support. Assistance in utilization of CCSDS products will be offered. On occasion, members of space-related industries may sponsor exhibits of their CCSDS-compatible products.

6 DOCUMENT DEVELOPMENT AND MAINTENANCE

6.1 CCSDS RECOMMENDATION

6.1.1 PURPOSE

A CCSDS Recommendation is a Standards Track specification intended to serve as the basis for a formal standard.

6.1.2 DEVELOPMENT

6.1.2.1 Development to Formal Agency Review

The following steps define the Recommendation development process from Concept Paper to Draft Recommendation:

- a) a BOF shall present a Concept Paper to the CESG (see 4.4.3);
- b) upon acceptance of the CP, a WG shall be chartered by the CESG and approved by the CMC;
- c) through a consensus process the WG shall agree on the content of a Proposed Recommendation, and a technical editor shall be assigned to draft the Proposed Recommendation;
- d) the Proposed Recommendation shall be developed to maturity by the WG through multiple iterations:
 - the WG Chair shall determine when each draft issue is published;
 - every draft issue must clearly state the status of the Proposed Recommendation and must indicate the risks associated with implementing it in its current state;
- e) when the WG has determined that the Proposed Recommendation is mature, the WG Chair must
 - petition the CESG via the AD for permission to designate it as a Draft Recommendation, and
 - demonstrate that its contents represent the true consensus of the group;
- f) upon acceptance of the petition, the CESG shall ask the CMC to authorize formal Agency review.

NOTE – Authorization of formal Agency review marks the transition in status from Proposed Recommendation to Draft Recommendation.

6.1.2.2 Special Requirements for Draft Recommendations

Draft Recommendations approved for formal Agency review are considered to be mature technical specifications. A Draft Recommendation that has been approved for formal Agency review may not be changed in any substantive way except as may be necessitated by formal review comments. Changes made in response to review comments are expected to be limited in scope.

If a document requires major modification in order to gain Agency approval, the CESG must be consulted and the change must be approved by the CESG.

If, between reviews, the WG feels compelled to improve the document by reorganizing, rewriting, adding, or deleting whole sections, or by otherwise subjecting the document to such massive change that it differs substantially from the version released for the preceding review, then that document shall be removed from the formal review process and shall require additional approval to return to review when it is deemed stable.

6.1.2.3 Formal Agency Review

Upon CMC approval to release a document for formal Agency review, the document developer shall deliver the following to the Secretariat:

- a) the approved version of the document in word-processor format;

NOTE – The Secretariat may request that original graphics and similar components be supplied in their original format.

- b) any ancillary review materials, such as Informational Reports in word-processor format;
- c) identification of the review coordinator to whom Agency review comments should be forwarded;
- d) identification of any constraints that should be placed on the review schedule.

Upon receipt, the Secretariat shall

- a) assure that the document conforms to the requirements of the CCSDS Publications Manual;
- b) prepare necessary review materials, such as Review Item Disposition (RID) initiation forms and detailed review instructions, and post all review materials on the CCSDS Web site;
- c) distribute a review announcement, in which the on-line location of the review materials and the review beginning and ending dates are identified, to the CCSDS Agencies, CESG, and Liaison organizations.

The schedule for the review shall normally allow ninety days from the time of the review commencement for Agencies to conduct review and return comments to the review coordinator:

- a) the length of the review period may be adjusted according to the size and complexity of the review document;
- b) constraints on the review period identified by the document developer shall be considered when determining the length of a review period, but providing adequate time for Agency review shall be the primary consideration.

Once review of a document has been approved, that document may be reviewed more than once without additional approval of the CMC:

- a) if technical issues are identified in the course of a review, those issues must be resolved and the review must be repeated before approval can be sought for a change of document status;
- b) increasing draft issue numbers shall be assigned to successive versions of the draft document released in successive iterations of the review (see annex A);
- c) if substantive changes are made to a document that has completed review without technical comment, the Secretariat shall conduct a final review in which Agencies can approve or reject the document but may not suggest additional changes;
- d) the Secretariat shall follow the same procedures for posting review materials and review announcement for each iteration of a review.

However, to prevent a document from languishing in perpetual review, either the CMC or the CESG may terminate review of a document if progress toward satisfactory completion of the review is lacking. The CESG is expected to remain cognizant of the status of all documents that have been approved for review and have not completed the review process. Under normal circumstances, no more than four months should elapse between the end of one review and the beginning on the next.

Each CCSDS Agency shall be responsible for establishing local procedures for review of CCSDS documents.

6.1.2.4 Requirements for Finalizing a Recommendation

The following criteria must be satisfied before a Draft Recommendation can be eligible for approval and release as a CCSDS Recommendation:

- a) the results of formal Agency review must be satisfactorily incorporated;
- b) either

- 1) at least two independent and interoperable prototypes or implementations must have been developed and demonstrated in an operationally relevant environment, either real or simulated:
 - the WG Chair is responsible for documenting the specific implementations that qualify the specification for CCSDS Recommendation status, along with reports relevant to their testing;
 - if patented or otherwise controlled technology is required for the separate implementations, they each must also have resulted from separate exercise of the licensing process, and it must be demonstrated by the WG Chair that the licensing process and fees are fair and non-discriminatory;
 - in cases in which one or more options or features have not been demonstrated in at least two interoperable prototypes or implementations, the specification may advance to the CCSDS Recommendation level only if those options or features are removed;
 - the documentation of qualifying implementations must include specific statements about the ability to support each of the individual options and features; or
- 2) the WG Chair formally requests and obtains approval of the CESC to have the implementation requirement waived:
 - request for waiver and CESC approval should occur at the time of the WG's formation, or early in the WG development phase, and not at the end of formal Agency review;
 - the request for waiver must provide rationale for waiving the requirement.

When these criteria have been met, the CESC shall ask the CMC to authorize publication of the Draft Recommendation as a CCSDS Recommendation.

NOTE – Authorization of publication marks the transition in status from Draft Recommendation to Recommendation.

6.1.3 PUBLICATION

Upon CMC approval to publish a document as a CCSDS Recommendation, the document developer shall deliver the document in word-processor format to the Secretariat for publication.

6.1.4 MAINTENANCE

The following steps make up the CCSDS Recommendation maintenance process:

- a) the CESG must review the Recommendation for continued relevance no later than five years from its date of issuance;
- b) based on that review, the CESG shall ask the CMC to do one of the following:
 - reconfirm the document:
reconfirmation shall reset the five-year clock for CESG review;
 - authorize transition to CCSDS Historical status:
transition to Historical status shall end the Recommendation's maintenance lifecycle;
 - authorize establishment of a WG to update the Recommendation:
establishment of a WG shall restart the development process defined in 6.1.2; additionally:
 - if changes are made only to discrete parts of an existing Recommendation, only the changed parts shall be subjected to formal Agency review;
 - upon completion of the development process, the document shall be reissued with the next consecutive issue number, and the earlier issue shall undergo transition to CCSDS Historical status.

6.2 CCSDS BEST CURRENT PRACTICE DOCUMENT (BCP)

6.2.1 PURPOSE

A CCSDS Best Current Practice document (BCP) is a Standards Track document that records the consensus of CCSDS technical experts concerning the best current thinking on a statement of principle or on what is believed to be the best way to perform some operations or CCSDS process function. Uses of BCPs include

- application profiles for CCSDS specifications recommended for use in particular mission support configurations;
- common guidelines for policies and operations of mission infrastructure networks.

6.2.2 DEVELOPMENT

The following steps make up the BCP document development process:

- a) a BOF shall present a Concept Paper to the CESG;
- b) upon acceptance of the CP, a WG shall be chartered by the CESG and approved by the CMC;

- c) through a consensus process the WG shall agree on the content of the BCP and produce a Proposed BCP;
- d) the Proposed BCP shall be developed by the WG through multiple iterations:
 - the WG Chair shall determine when each draft issue is published,
 - every draft issue must clearly state the status of the BCP and must indicate the risks associated with implementing it in its current state;
- e) when the WG has determined that the Proposed BCP is mature, the WG Chair must
 - demonstrate that its contents represent the true consensus of the group, and
 - petition the CESG via the AD to submit the document to formal Agency review;
- f) upon acceptance of the petition, the CESG shall ask the CMC to authorize formal Agency review;

NOTE – Authorization of formal Agency review marks the transition in status from Proposed BCP to Draft BCP.

- g) formal Agency review shall follow the procedures specified in 6.1.2.3;
- h) when the formal Agency review has been completed and its results satisfactorily incorporated, the CESG shall ask the CMC to authorize its publication as a CCSDS Best Current Practice document.

NOTE – Authorization of publication marks the transition in status from Draft BCP to BCP.

6.2.3 PUBLICATION

Upon CMC approval to publish a BCP, the document developer shall deliver the document in word-processor format to the Secretariat for publication.

6.2.4 MAINTENANCE

The following steps make up the BCP maintenance process:

- a) the CESG must review the BCP for continued relevance no later than five years from its date of issuance;

NOTE – At any time during the five years following issuance of the BCP, the CESG may initiate review to determine whether an update is needed to adapt to changes in technologies, add enhancements, etc.

- b) based on that review, the CESG shall ask the CMC to do one of the following:

- reconfirm the document:
reconfirmation shall reset the five-year clock for CESG review;
- authorize transition to CCSDS Historical status:
transition to Historical status shall end the BCP's maintenance lifecycle;
- authorize establishment of a WG to update the BCP:
establishment of a WG shall restart the development process defined in 6.2.2.

6.3 CCSDS EXPERIMENTAL SPECIFICATION

6.3.1 PURPOSE

A CCSDS Experimental Specification is a Non-Standards Track document that records engineering concepts that are part of some research or development effort. Its funding and other associated resources are normally independently provided by the organization that initiates the work, so the CCSDS role is limited to one of periodic review and publication. Experimental work may be based on soft or 'prospective' requirements; i.e., it may be looking into the future and may intend to demonstrate technical feasibility in anticipation of a 'hard' requirement that has not yet emerged. This designation therefore allows the work to progress roughly to the equivalent technical status of a Draft Recommendation without being actually on the Standards Track and therefore consuming large amounts of CCSDS resources. Experimental work may be rapidly transferred onto the Standards Track if a hard requirement emerges, thus shortening the response time in satisfying the new customer.

However (unlike Standards Track documents) it is not necessary to demonstrate broad support across the CCSDS community before a WG is approved. One organization could volunteer independently to perform Experimental work, providing that the Area Director is convinced that it is a positive contribution towards the work of CCSDS and that sufficient resources exist to produce a meaningful result. Demonstration of the work's being a 'positive contribution' is most important: a WG will not be allowed to form unless it has demonstrated that the proposed Experimental work is architecturally relevant to CCSDS and will not be disruptive to the installed base if eventually implemented.

6.3.2 DEVELOPMENT

The following steps make up the Experimental Specification development process:

- a) a BOF shall present a Concept Paper to the CESG;
- b) upon acceptance of the CP, a WG shall be chartered by the CESG and approved by the CMC;
- c) through a consensus process the WG shall agree on the content and produce a Draft Experimental Specification;

- d) the Draft Experimental Specification shall be developed by the WG through multiple iterations:
 - the WG Chair shall determine when each draft issue is published;
 - every draft issue must clearly state the status of the BCP and must indicate the risks associated with implementing it in its current state;
- e) at such time as the WG has completed the development, the WG Chair may petition the CESG via the AD to publish the final document as ‘CCSDS Experimental’:
 - as a general rule, prior to publication at least one hardware or software prototype (or other implementation) must exist which demonstrates and exercises all of the options and features of the specification in an operationally relevant environment, either real or simulated;
 - the WG Chair is responsible for documenting the specific implementation that qualifies the specification for CCSDS Experimental status, along with reports relevant to its testing, or for justifying why the implementation requirement should be waived;
 - the documentation of the qualifying implementation must include clear statements about its ability to support each of the individual options and features;
 - if patented or otherwise controlled technology is required for the implementation, it must be demonstrated that the licensing process and fees are fair and non-discriminatory;
- f) upon determining that all criteria for publication have been met, the CESG shall ask the CMC to authorize publication of the CCSDS Experimental Specification.

NOTE – There is no requirement for a formal Agency review prior to publishing a CCSDS Experimental Specification.

6.3.3 PUBLICATION

Upon CMC approval to publish an Experimental Specification, the document developer shall deliver the document in word-processor format to the Secretariat for publication.

6.3.4 MAINTENANCE

The following steps make up the Experimental Specification maintenance process:

- a) the CESG must review the Experimental Specification for continued relevance no later than five years from its date of issuance;
- b) based on that review, the CESG shall ask the CMC to do one of the following:
 - reconfirm the Experimental Specification:

reconfirmation shall reset the five-year clock for CESG review;

- authorize transition to CCSDS Historical status:

transition to Historical status shall end the Experimental Specification's maintenance lifecycle;

- retire the Experimental Specification:

retirement shall end CCSDS tracking of the document;

- authorize establishment of a WG to update the Experimental Specification:

establishment of a WG shall restart the development process defined in 6.3.2.

If hard requirements develop, the CESG shall ask the CMC to authorize formal Agency review of the Experimental Specification as a Draft Recommendation. Upon authorization, formal Agency review shall proceed, and the requirements stated in 6.1.2.3 shall apply.

6.4 CCSDS INFORMATIONAL

6.4.1 PURPOSE

A CCSDS Informational Report is a Non-Standards Track document used to record a broad range of technical information for the CCSDS community. Informational documents are often published in support of an Experimental Specification, a Draft Recommendation, or a Recommendation. They may therefore contain rationale, descriptive material, supporting analysis, test results, scenarios, etc., which are otherwise inappropriate for the contents of a technical specification (see reference [3]).

6.4.2 DEVELOPMENT

Informational documents are normally developed by existing WGs chartered to develop Standards Track documents. This Procedures Manual does not, however, prohibit the chartering of a WG for the sole purpose of developing an Informational document. In any case, the following steps make up the Informational document development process:

- a) the Draft Informational Report shall be developed by the WG through multiple iterations:
 - the WG Chair shall determine when each draft issue is published;
 - every draft issue must clearly state that the document is in draft status;
- b) at such time as the WG has completed the development, the WG Chair may petition the CESG via the AD to publish the final document as a CCSDS Informational Report;

NOTES

- 1 Approval will normally be subject only to editorial considerations and to verification that there has been adequate coordination with the standards process.
- 2 There is no requirement for a formal Agency review prior to publishing a CCSDS Informational document.
- c) upon determining that the document has completed its development, the CESC shall ask the CMC to authorize publication as a CCSDS Informational Report.

6.4.3 PUBLICATION

Upon CMC approval to publish an Informational Report, the document developer shall deliver the document in word-processor format to the Secretariat for publication.

6.4.4 MAINTENANCE

Because CCSDS Informational Reports are often linked to specifications, the CESC must maintain a register of CCSDS Informational Reports that relate to CCSDS Standards Track publications. Whenever a change occurs to a published Standards Track document, the CESC must review all related Informational Reports to determine whether they need to be updated. If an update is needed, the CESC shall assign the Informational Report update to the WG chartered to update the related Standards Track publication.

In the absence of an update to a related Standards Track publication, the following steps also apply:

- a) the CESC must review the Informational Report for continued relevance no later than five years from its date of issuance;
- b) based on that review, the CESC shall ask the CMC to do one of the following:
 - authorize transition to CCSDS Historical status:
transition to Historical status shall end the Informational Report's maintenance lifecycle;
 - retire the Informational Report:
retirement shall end CCSDS tracking of the document;
 - update the Informational Report:
the CESC shall do one of the following:
 - assign the update task to an existing WG into whose chartered activities the work naturally falls;

- create a new WG for the purpose of updating the document;
- appoint an editor to update the document without creating a WG.

6.5 CCSDS HISTORICAL STATUS

CCSDS Historical status is a Non-Standards Track designation for any published CCSDS document that has been superseded by a more recent version or has for any other reason been deemed to be obsolete. More often than not, a document having CCSDS Historical status will be a CCSDS Recommendation that has come to the end of its useful operational life and no longer controls a committed deployment of international CCSDS-compatible mission support infrastructure. However, Historical status can also be used to archive various stages of a CCSDS Draft Recommendation or other documents if there is a strong need to preserve key information or concepts. An Area Director shall determine which documents should undergo transition to CCSDS Historical status: the CESG and the CMC must approve this recommendation, but there is no requirement for a formal Agency review.

CCSDS Historical documents shall be archived by the Secretariat on the CCSDS Web site.

6.6 CCSDS RECORD

6.6.1 PURPOSE

A CCSDS Record is an Administrative Track document used for administrative topics such as CCSDS charters, procedures, conference proceedings, meeting minutes, and informational publications issued by the CMC or the Secretariat.

6.6.2 DEVELOPMENT

Procedures used in the development of CCSDS Records are determined by the developer organizational unit.

For CCSDS Records that are internal to CCSDS, only the approval by the organizational unit that produces the document is required for release.

For CCSDS Records intended for distribution outside CCSDS, CMC approval is required for final publication. CCSDS Records may be distributed in draft status, but that status must be identified on the document.

6.6.3 MAINTENANCE

CCSDS Records must be reviewed for continued relevance. It is the responsibility of the organization that releases a CCSDS Record to define the procedures and schedules for such

reviews. CCSDS Records released by dissolved WGs and BOFs become the responsibility of the CESC.

7 DOCUMENT MANAGEMENT

7.1 PUBLICATION, DISTRIBUTION, AND MAINTENANCE

7.1.1 CMC APPROVAL

The CMC has sole authority for approving release of CCSDS documents for publication or formal Agency review.

7.1.2 DOCUMENT DEVELOPER RESPONSIBILITIES

7.1.2.1 Drafting Requirements

Document developers shall prepare all documents that are on a track leading to formal Agency review and/or publication in accordance with the requirements of the CCSDS Publications Manual (see reference [3]).

7.1.2.2 Delivery Requirements

Document developers shall deliver all CMC-approved documents to the Secretariat for processing within sixty days following CMC approval of release. Documents that are not delivered within sixty days of approval shall be deemed not ready for release, and a new request for CMC approval shall be necessary for subsequent release.

7.1.3 SECRETARIAT RESPONSIBILITIES

The Secretariat shall be responsible for the publication, distribution, and maintenance of all documents approved by the CMC for publication.

The Secretariat shall be responsible for initiation of all formal Agency reviews and for distribution of review documents and review materials.

The Secretariat shall assure that all documents released for publication or formal Agency review shall conform to the requirements of the CCSDS Publications Manual.

The Secretariat shall maintain all documents released by the CMC:

- published documents shall be maintained on the CCSDS Web site and periodically distributed on CD ROM to permanent CCSDS organizational units;
- documents released for formal Agency review shall be maintained on the CCSDS Web site until superseded or withdrawn.

NOTE – Drafts that have completed formal Agency review may undergo transition to Historical status on the recommendation of the AD.

7.2 DOCUMENT IDENTIFICATION

7.2.1 DOCUMENT NUMBERING SYSTEM

CCSDS documents shall be numbered in accordance with the following system:

CCSDS PXX.V-C-I.r

where

P is a single character identifier designating a specific topic area (see annex B for current P assignments).

XX is a double character identifier designating a related major sub-topic.

EXCEPTION – The designation P00 is reserved in every instance for an Overview type Informational Report that describes in some detail the considerations that characterize the topic area.

V is a single character identifier designating a related minor sub-topic.

C is a single character corresponding to the type of the document. It must be one of characters listed in table 7-1.

I is an integer designating the issue number of the document.

r is a CCSDS-internal control mechanism for tracking document revisions which occur between issue numbers. Here, as applied to the iterative process of finalizing a document under review, the 'r' is incremented for successive versions.

An example of this numbering system is shown in annex B.

Table 7-1: 'C' Designations for Document Type

Character	Mnemonic	Document Type
W	White Book	Proposed Recommendation
R	Red Book	Draft Recommendation
B	Blue Book	Final Recommendation
G	Green Book	Informational Report
Y	Yellow Book	Record (administrative or meeting report)
P	Pink Sheets <i>or</i> Pink Book	Proposed Revised Recommendation
M	Magenta Book	Best Current Practice document
O	Orange Book	Experimental Specification
S	Silver Book	Document having Historical status

7.2.2 DOCUMENT NUMBER ASSIGNMENT

The Secretariat maintains a database of all assigned document numbers. In order to maintain continuity and avoid duplication, ADs should request a number assignment from the Secretariat whenever a number is needed for a new document. The request assures that a unique number is assigned and that the number is recorded in the Secretariat data base.

Some Areas may ‘own’ a block of numbers for a given topic and may assign numbers from within that block to new documents according to an Area-internal classification system. In such cases the AD is responsible for assuring system integrity and for informing the Secretariat of new number assignments.

7.2.3 IDENTIFICATION OF EXTERNAL STANDARDS

The Document Identification of any externally developed standard that has been incorporated into the CCSDS suite of Recommendations shall retain that identification assigned by the originating organization.

7.3 SPECIAL STATUS DESIGNATIONS

7.3.1 MODIFICATION PROHIBITION

Under some circumstances the CMC may explicitly prohibit modification of a document. For example, a draft Recommendation that has successfully completed Agency review may require additional testing before it can be formally approved as a CCSDS Recommendation. In such a case, the CMC shall declare the document to be “frozen” in its current state until all testing activities are concluded. The CMC may similarly prohibit further updates to a published Recommendation, for example, when a Recommendation is expected to be superseded or retired in the future but continues to be valid in the near term.

7.3.2 OTHER SPECIAL DESIGNATIONS

The CMC has the discretion to apply special designations to documents in response to unforeseen circumstances. For example, the CMC may choose to include a dedication in a document after it has completed development.

7.3.3 DENOTATION OF SPECIAL DESIGNATIONS

Procedures for denoting special designations in the documents to which they are applied are defined in the CCSDS Publications Manual (reference [3]).

ANNEX A

FORWARDING FORMS

(July 2002)

A1 OVERVIEW

This annex presents various forms used by the Secretariat in the distribution of CCSDS documentation. The forms presented are baseline forms intended to illustrate by example the actual forms used. For a given distribution, the Secretariat may prepare various versions of a particular form, since the Secretariat routinely distributes documents to a variety of recipient categories.

The forms presented in this annex are:

- a Draft Recommendation review request form;
- a Corrigendum form;
- a RID Initiation form.

A2 DRAFT RECOMMENDATION FORWARDING FORM

A standard Draft Recommendation forwarding form is shown on the facing page. A variation of this form may be used to distribute other types of review documents, e.g., a draft Record. Variables to be filled in at the time of distribution are as follows:

- [CtrlNo] is an internal distribution control number assigned by the Secretariat;
- [RevBegins] is the beginning date for review of the attached document;
- [RevEnds] is the ending date for the review, by which time all comments should be forwarded to the review coordinator;
- [Citation] is a brief citation for the document, giving title, issue, issue date, and document identifying number;
- [Document Description] is a brief description of the review document in terms of the problem it proposes to solve;
- [Review Coordinator] is the name and contact information for an individual responsible for receiving review comments.



REQUEST FOR REVIEW OF CCSDS DOCUMENT

Control number: [CtrlNo] Distribution: **On Line**
Review begins [RevBegins] Review ends: [RevEnds]

The Management Council of the Consultative Committee for Space Data Systems (CCSDS) has authorized the publication, and requests Agency review, of the following:

[Citation]

Click here to access a Portable Document Format (PDF) version of the review document.
(File:[file name, size]. Requires Acrobat™ 4.0 or later version.)

Notes on printing

DOCUMENT DESCRIPTION: [Document Description]

REVIEW INSTRUCTIONS: Member and Observer Agencies are requested to send their sets of review comments to the Review Coordinator with a copy to the CCSDS Secretariat. Each review comment should be submitted on a separate Review Item Disposition (RID) form. Submission of RIDs in electronic form is preferred. The following ASCII RID forms are available (click on form name for access):

Standard RID form for reviewer use.

Agency RID form (includes approval and concurrence fields).

REVIEW COORDINATOR:

[Review Coordinator]

A copy of the set of Agency review comments should be forwarded to the Secretariat at the following address:

CCSDS Secretariat
NASA Headquarters, Code M-3
Washington, DC 20546, USA

Fax: +1 202 358 2830
E-mail: ccsds@lists.hq.nasa.gov

A3 CORRIGENDUM FORM

The standard Corrigendum form is shown on the facing page. Variables to be filled in at the time of distribution are as follows:

- [DocNumber] is the document identifying number of the Recommendation against which the corrigendum is being issued;
- [CorNumber] is an integer indicating the number of the corrigendum;
- [CorIssueDate] is the date when the corrigendum was approved by the CMC;
- [Title of Published Recommendation] is the title of the Recommendation against which the corrigendum is being issued;
- [DocIssueDate] is the original issue date of the Recommendation against which the corrigendum is being issued;
- [Internal Ctrl Number] is an internal distribution control number assigned by the Secretariat.



RECOMMENDATION [DocNumber]
TECHNICAL CORRIGENDUM [CorNumber]

Issue Date: [CorIssueDate]

[Title of Published Recommendation]

TECHNICAL CORRIGENDUM [CorNumber]

The Management Council of the Consultative Committee for Space Data Systems (CCSDS) has authorized the publication of corrigendum [CorNumber] to [DocNumber], issued [DocIssueDate].

[Page (Range) Reference]

[Instructions for Making Change]

[Rationale for Change]

Control Number: [Internal Ctrl Number] **Corrigendum Identifying Number:** [DocNumber] **Cor.** [CorNumber]

Correspondence regarding CCSDS documents should be addressed to

CCSDS Secretariat
NASA Headquarters, Code M-3
Washington, DC 20546, USA

Fax: +1 202 358 3520
Internet: ccsds@lists.hq.nasa.gov

A4 REVIEW ITEM DISPOSITION FORM

The standard Review Item Disposition (RID) initiation form for CCSDS Draft Recommendation and Draft BCP reviews is shown on the facing page. The variables to be filled in at the time of distribution are the standard citation information for the document being distributed for review.

PROCEDURES MANUAL FOR THE CONSULTATIVE COMMITTEE FOR SPACE DATA SYSTEMS

CCSDS REVIEW ITEM DISPOSITION (RID):
RID INITIATION FORM

AGENCY RID NUMBER:

SUBMITTING ORGANIZATION (Agency, Center):

REVIEWER'S NAME:

CODE:

E-MAIL ADDRESS

TELEPHONE:

DOCUMENT NUMBER: [DocNumber] [Color Book], [Issue Number]

DOCUMENT NAME: [Title]

DATE ISSUED: [Issue Date]

PAGE NUMBER:

PARAGRAPH NUMBER:

RID SHORT TITLE:

____ APPROVE (MEMBER) ____ CONCUR (OBSERVER) ____ COMMENTS

DESCRIPTION OF REQUESTED CHANGE: (Use From: '...' To '...' format)

CATEGORY OF REQUESTED CHANGE:

Technical Fact ____ Recommended: ____ Editorial: ____

NOTES:

TECHNICAL FACT: Major technical change of sufficient magnitude as to render the Recommendation inaccurate and unacceptable if not corrected. (Supporting analysis/rationale is essential)

RECOMMENDED: Change of a nature that would, if incorporated, produce a marked improvement in document quality and acceptance

EDITORIAL: Typographical or other factual error needing correction. (This type of change will be made without feedback to submitter.)

SUPPORTING ANALYSIS:

DISPOSITION:

ANNEX B

CCSDS DOCUMENT NUMBERING SYSTEM

(August 1996)

B1 THE CURRENTLY ASSIGNED P-IDENTIFIERS ARE:

- 1 - Telemetry Systems
- 2 - Telecommand Systems
- 3 - Ancillary Data
- 4 - RF and Modulation Systems
- 5 - Tracking and Navigation Systems
- 6 - Information Access and Interchange Systems
- 7 - Advanced Orbiting Systems
- 8 - Unassigned
- 9 - Cross Support Concepts, Services and Architecture

- A - Administrative and Organizational Reports
- B - Meeting Reports and Summaries
- C - Workshop Reports and Summaries
- D - Technical Planning Reports and Summaries

B2 EXAMPLE OF DOCUMENT NUMBERING SYSTEM

B2.1 For the **initial development** of a Recommendation:

- Proposed Recommendation Development:

	<u>Designation</u>	<u>Number</u>
Issue 1	Proposed Recommendation	CCSDS 101.0-W-1
Issue 2	Proposed Recommendation	CCSDS 101.0-W-2
Issue <i>n</i>	Proposed Recommendation	CCSDS 101.0-W- <i>n</i>

- Draft Recommendation Iteration:

	<u>Designation</u>	<u>Number</u>
Issue 1	Draft Recommendation	CCSDS 101.0-R-1
Issue 2	Draft Recommendation	CCSDS 101.0-R-2
Issue <i>n</i>	Draft Recommendation	CCSDS 101.0-R- <i>n</i>

- Approved Recommendation:

	<u>Designation</u>	<u>Number</u>
Issue 1	Recommendation	CCSDS 101.0-B-1
Issue 2	Recommendation	CCSDS 101.0-B-2
Issue <i>n</i>	Recommendation	CCSDS 101.0-B- <i>n</i>

B2.2 For **subsequent changes** to a Recommendation:

- Corrigenda to Recommendations:

	<u>Designation</u>	<u>Number</u>
First corrigendum	Corrigendum 1	CCSDS 101.0-B-1 Cor. 1
Second corrigendum	Corrigendum 2	CCSDS 101.0-B-1 Cor. 2

NOTE – No more than two corrigenda may be issued against a given issue of a Recommendation; the need for a third corrigendum would result in a revision.

- Draft Revisions to Recommendations:

	<u>Designation</u>	<u>Number</u>
First draft issue	Draft Revision Issue 1	CCSDS 101.0-P-1.1
Second draft issue	Draft Revision Issue 2	CCSDS 101.0-P-1.2
<i>n</i> th draft issue	Draft Revision Issue <i>n</i>	CCSDS 101.0-P-1. <i>n</i>

NOTES

- 1 In the ‘Draft Revisions to Recommendations’ example above, the issue being revised is Issue 1, numbered 101.0-B-1; the next approved issue resulting from the revision is Issue 2, numbered 101.0-B-2.
- 2 The Draft Revision numbering system does not distinguish between a set of revised pages or a completely revised book.